

Notice of Allowability

Application No.

09/992,354

Examiner

Wen-Tai Lin

Applicant(s)

CHEN ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 3/11/2005.
2. ☒ The allowed claim(s) is/are 1-7,9-10,12-16,18-21,23,29-35,37-38,40-43 and 45-46, renumbered as 1-34.
3. ☒ The drawings filed on 19 November 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

EXAMINER'S AMENDMENT

1. An examiner's Amendment to the record appears below. Should the changes and/or additions be unacceptable, an amendment may be filed as provided by 37 C.F.R. 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the Issue Fee.
2. Authorization for the examiner's amendment was given in a telephone interview with Mr. Kevin Shao, reg. no.45095, on June 1, 2005.
3. In the claims: please amend claims 1, 9, 14, 18-19, 23, 29, 37, and 42 to the following:
 1. (Currently Amended) A computer implemented method comprising:
selecting an updated set of attributes in a routing table before selecting a set of updated destinations associated with the selected set of attributes, wherein the selected set of attributes does not include a network prefix;
generating an update message that includes the set of updated destinations;
selecting a dummy attribute in the routing table before selecting a second set of updated destinations associated with the dummy attribute; and
generating a second update message indicating the second set of updated destinations as unreachable.

9. (Currently Amended) A computer implemented method comprising:

selecting a first data structure, the first data structure corresponding to a best path to a destination;

referencing a first element of a second data structure from the selected first data structure, the first element indicating a set of attributes of the best path, wherein the set of attributes does not include a network prefix;

referencing a second element of a third data structure from the first element, the second element indicating the destination;

determining a second destination to be unreachable; and

referencing a third element of the third data structure from a dummy element of the second data structure, the third element indicating the second destination.

14. (Currently Amended) A network device comprising:

a memory to host a routing table, the routing table to include a first data structure to indicate a set of destinations and a second data structure to indicate a set of attributes; and

a set of one or more processors coupled with the memory, the set of processors to process a network update message that indicates one of the set of destinations and a subset of the set of attributes and to insert the one of the set of destinations into a chain of elements of the first data structure in accordance with the network update message, the chain to be referenced by an element of the second data structure

that indicates the subset of the set of attributes, wherein the set of attributes does not include a network prefix,

wherein the set of processors is to insert a second element of the first data structure into a second attribute-oriented chain that is referenced by a dummy element of the second data structure.

18. (Currently Amended) A network device comprising:

a memory to host a routing table, the routing table to include a first data structure to indicate a set of destinations and a second data structure to indicate a set of attributes; and

a set of one or more processors coupled with the memory, the set of processors to process a network update message that indicates one of the set of destinations and a subset of the set of attributes and to insert the one of the set of destinations into a chain of elements of the first data structure in accordance with the network update message, the chain to be referenced by an element of the second data structure that indicates the subset of the set of attributes, wherein the set of attributes does not include a network prefix,

wherein the set of processors is to trace the attribute-oriented chain of elements, to generate a second network update message, and to indicate a subset of the set of destinations in the second network update message, the subset of destinations indicated by the attribute-oriented chain of elements.

19. (Currently Amended) A network device comprising:

a line card to receive an update message that indicates a destination and a set of attributes; and

a control card coupled with the line card, the control card to host a routing table, the routing table to include a first data structure to indicate a set of destinations and a second data structure to indicate a plurality of attributes, the control card to process the update message and to insert the destinations into a chain of elements of the first data structure in accordance with the update message, the chain to be referenced by an element of the second data structure, the element of the second data structure to indicate the set of attributes, wherein the set of attributes does not include a network prefix,

wherein the line card is to receive an unreachability update message indicating a second destination, and wherein the control card is to process the unreachability update message, to select a second element of the first data structure that indicates the second destination and to insert the selected second element into a dummy attribute-oriented chain.

23. (Currently Amended) A network device comprising:

a line card to receive an update message that indicates a destination and a set of attributes; and

a control card coupled with the line card, the control card to host a routing table, the routing table to include a first data structure to indicate a set of destinations and a

second data structure to indicate a plurality of attributes, the control card to process the update message and to insert the destinations into a chain of elements of the first data structure in accordance with the update message, the chain to be referenced by an element of the second data structure, the element of the second data structure to indicate the set of attributes, wherein the set of attributes does not include a network prefix,

wherein the control card is to trace the chain of elements, to generate a second network update message, and to indicate a subset of the set of destinations in the second network update message, the subset of destinations indicated by the chain of elements.

29. (Currently Amended) A machine readable medium, which when executed by a set of one or more processors, cause said set of processors to perform operations comprising:

selecting an updated set of attributes in a routing table before selecting a set of updated destinations associated with the selected set of attributes, wherein the set of attributes does not include a network prefix;

generating an update message that includes the set of updated destinations for the set of attributes;

selecting a dummy attribute in the routing table before selecting a second set of updated destinations associated with the dummy attribute; and

generating a second update message indicating the second set of updated destinations as unreachable.

37. (Currently Amended) A machine readable medium, which when executed by a set of one or more processors, cause said set of processors to perform operations comprising:

- selecting a first data structure, the first data structure corresponding to a best path to a destination;
- referencing a first element of a second data structure from the selected first data structure, the first element indicating a set of attributes of the best path, wherein the set of attributes does not include a network prefix;
- referencing a second element of a third data structure from the first element, the second element indicating the destination;
- determining a second destination to be unreachable; and
- referencing a third element of the third data structure from a dummy element of the second data structure, the third element indicating the second destination.

42. (Currently Amended) A machine readable medium, which when executed by a set of one or more processors, cause said set of processors to perform operations comprising:

- selecting an element of a first data structure that is marked, the element indicating a set of attributes, wherein the set of attributes does not include a network prefix;
- creating a network update message;
- indicating the set of attributes in the message;

indicating a set of one or more destinations in the update message, the set of destinations indicated by a set of linked elements of a second data structure, the element of the first data structure referencing the set of linked elements;
determining a second destination to be unreachable; and
referencing a fourth element of the second data structure from a dummy element of the first data structure, the fourth element indicating the second destination.

4. The Abstract has been amended to highlight the featured invention (see the attached page).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wen-Tai Lin whose telephone number is (571)272-3969. The examiner can normally be reached on Monday-Friday (8:00-5:00) .

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Follansbee can be reached on (571)272-3964. The fax phone numbers for the organization where this application or proceeding is assigned are as follows:

(703)872-9306 for official communications; and

(571)273-3969 for status inquires draft communication.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wen-Tai Lin

June 1, 2005

Wen-Tai Lin
6/1/05

ABSTRACT OF THE DISCLOSURE

A computer implemented method and apparatus for an attribute-oriented routing update is described. The method comprises selecting an updated set of attributes in a routing table before selecting a set of updated destinations associated with the selected set of attributes, wherein the attributes are stored in an attribute table as a portion of the routing table and the attributes do not include the conventional network prefixes. An update message that includes the set of updated destinations for the set of attributes is then generated. The method is also extended to extraction of unreachable destinations by using a dummy attribute in the routing table, wherein the dummy attribute is selected first, followed by extracting the unreachable destinations.